

**Instruction Sheet  
for the PASCO  
Model SF-8619**

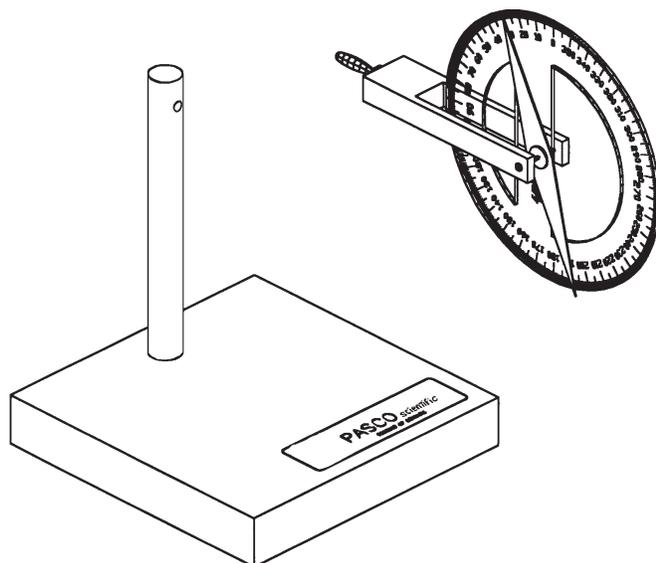
## MAGNETIC DIP NEEDLE

### Introduction

This compass needle is used to measure the dip angle of the Earth's magnetic field. However, it may also be used in its horizontal position as a conventional compass.

### Setup Procedure

- Assemble the two parts of the dip needle by inserting the banana plug connector into the hole in the black rod on the stand, as shown in equipment setup diagram.



**Equipment Setup**

- Put the dip needle in a location which is far away from any ferromagnetic materials and other magnetic fields. If you place the dip needle on a table, be sure there are no ferromagnetic supports under the table top.
- Rotate the dip needle at its banana plug connection until the plastic scale is in the horizontal plane.

- While in the horizontal position, rotate the entire apparatus to align the compass needle with the axis of banana plug pivot.
- Without changing the orientation of the base, rotate the dip needle at its banana plug connection until the plastic scale is in the vertical plane.

### Theory

The dip needle is a magnetized steel needle which rotates around its center of mass. When no other magnetic fields are present, the dip needle will align itself along the direction of the Earth's magnetic field. The dip angle, or inclination, is the angle between the horizontal plane and the total Earth magnetic field. By convention, the dip angle is positive when pointing downwards.

The dip needle apparatus measures the angle,  $\theta$  between the vertical plane and the total Earth magnetic field. In order to obtain the dip angle, subtract  $\theta$  from  $90^\circ$ .

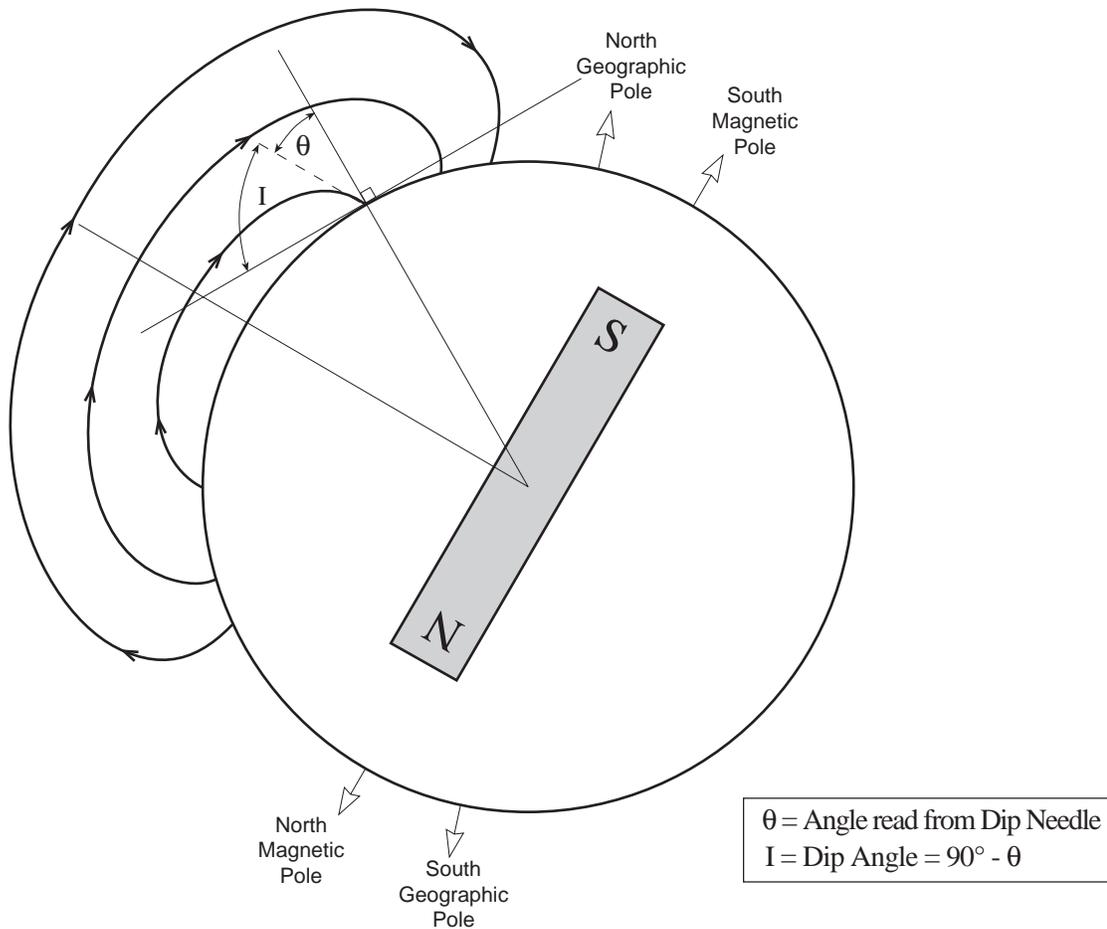
The United States Geological Survey maintains a public domain program for IBM compatible computers which models geomagnetic parameters including dip angle. The user inputs their latitude, longitude and elevation and the program calculates the dip angle. Copies of the program are free of charge and are available over the Internet via the following methods:

ftp host:	ftp.ngdc.noaa.gov	login anonymous
gopher host:	gopher.ngdc.noaa.gov	no login necessary
www host:	http://www.ngdc.noaa.gov	no login necessary

The appropriate file is `pcgeomag.zip` which contains the source code, executable and documentation files along with the current magnetic field model.

© 1990 PASCO scientific

This instruction sheet written/edited by: Ann Hanks



**Dip Angle for Northern California**

### Copyright Notice

The PASCO scientific Model SF-8619 Magnetic Dip Needle manual is copyrighted and all rights reserved. However, permission is granted to non-profit educational institutions for reproduction of any part of this manual providing the reproductions are used only for their laboratories and are not sold for profit. Reproduction under any other circumstances, without the written consent of PASCO scientific, is prohibited.

### Limited Warranty

PASCO scientific warrants this product to be free from defects in materials and workmanship for a period of one year from the date of shipment to the customer. PASCO will repair or replace, at its option, any part of the product which is deemed to be defective in material or workmanship. This warranty does not cover damage to the product caused by abuse or improper use. Determination of whether a product failure is the result of a manufacturing defect or improper use by the customer shall be made solely by PASCO scientific. Responsibility for the return of equipment for warranty repair belongs to the customer. Equipment must be properly packed to prevent damage and shipped postage or freight prepaid. (Damage caused by improper packing of the equipment for return shipment will not be covered by the warranty.) Shipping costs for returning the equipment, after repair, will be paid by PASCO scientific.